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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/972,178	10/09/2001	Hanae Shimokawa	500.38665CX1	5052

20457 7590 12/31/2002  
ANTONELLI TERRY STOUT AND KRAUS  
SUITE 1800  
1300 NORTH SEVENTEENTH STREET  
ARLINGTON, VA 22209

EXAMINER

ZIMMERMAN, JOHN J

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 12/31/2002

12

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/972,178

Applicant(s)

SHIMOKAWA ET AL.

Examiner

John J. Zimmerman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14, 19-27 and 40-83 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 19-27 and 40-83 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/581,631.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## OFFICE ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 7, 2002 has been entered.

### *Amendments*

2. This Office Action is in response to the Amendment received October 7, 2002. Claims 1-14, 19-27 and 40-83 are pending in this application.

### *Double Patenting*

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

4. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

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5. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 1-14, 19-27 and 40-83 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over the claims of copending Application No. 09/581,631. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the pending claims of this application and the scope of the claims of the copending application overlap. The claims of both applications are directed to the same invention of using a Sn-Bi alloy layer on electronic articles and the use of lead free solders on these layers. It is noted that the both pending applications contain claims that are specific to the same types of devices (e.g. semiconductor devices - see claims 36-50 of SN 09/581,631 and claims 1-14, 19-27, 40-42, 58-59, 78-82 of SN 09/972,178) and electronic devices having electrodes and circuit boards (e.g. see claims 14-35 of SN 09/581,631 and claims 43-59 of SN 09/972,178). There is no patentable distinction between the two sets of pending claims. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-14, 19-27 and 40-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanimoto (U.S. Patent 6,110,608).

9. Tanimoto discloses forming electronic lead materials with a first coating of Sn-Bi alloy and a second solder coating which may be a Sn-Bi-Ag alloy (e.g. see column 3, line 63 - column 4, line 62). Specific examples of the Sn-Bi and Sn-Bi-Ag materials can be found in the tables (e.g. see Example 33 in Table 3 for specific Sn-Bi-Ag composition considered part of Tanimoto's invention and also see Example 44 in Table 3 which shows that the use of dual Sn layers containing Bi is part of Tanimoto's invention). The electrodes of Tanimoto may be copper plated (e.g. see column 6, lines 33-44). Tanimoto even discloses Sn-10%Bi plated without an intermediate layer or a second plated layer in Comparative Example 5 of Table 3. Of particular relevance to the pending claims, Tanimoto also specifically discloses that his invention also covers embodiments wherein the two-layer structure plated layers are melted, and the components such as Bi or Ag, contained in a new plated layer formed during re-solidifying after melting are in the state of dilution by Sn (e.g. see column 6, lines 7-19, for two-layer reflowed into a layer with lower overall Bi content). Therefore, it is clearly understood by one of ordinary skill in the art that reflowing Tanimoto's two layer embodiments so that they are a single reflowed layer is also considered by Tanimoto to be his invention.

10. Tanimoto may differ from the claims in that Tanimoto may not disclose the use of various substrates (e.g. Fe-Ni alloy) or various types of leads (e.g. TSOP leads). The examiner,

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however, had previously taken Official Notice that Fe-Ni alloy is conventionally used in the art as an alternative to copper alloy leads for semiconductor devices and the examiner also had previously taken Official Notice that thin small outline package devices (TSOP) are conventional chip packages in the art. This alternative use of Fe-Ni alloy leads and the conventional use of TSOP devices is so well known in the art that Official Notice can be taken on these issues. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Fe-Ni alloys for the leads of Tanimoto because Fe-Ni alloys are understood in the art to be obvious alternatives to copper alloys for leads when thermal expansion issues, strength and expense are issues. In addition, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the compositions of Tanimoto for TSOP devices because Tanimoto clearly discloses the use for analogous devices and it would be understood that leads of TSOP devices would benefit from the same coating compositions.

11. As noted above, it would be understood by one of ordinary skill in the art that Tanimoto clearly discloses that reflow melting of his two layers into one layer is considered by Tanimoto to be his invention (e.g. see column 6, lines 7-19, for two-layer reflowed into a layer with lower overall Bi content). Tanimoto, however, may not specifically show examples wherein reflowed electronic leads are coated with specific lead free solders. The examiner notes, however, that Tanimoto clearly discloses that the use of "Pb contained in the solder has an adverse affect on human bodies. For that reason, in spite of its excellent properties, use of the solder is shunned. Recently, therefore, Sn alloys which do not contain Pb, that is, Sn-Ag alloy, a Sn-Bi alloy, a Sn-In alloy and a Sn-Zn alloy have taken the place of the Pb-containing Sn alloy" (column 1, lines

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60-65). It is clear from Tanimoto's statement on lead containing alloys that Tanimoto clearly understands that lead containing alloys generally should not be used and that they have been replaced by lead free alloys in current practice. Therefore it would be understood by one of ordinary skill in the art at the time the invention was made that Tanimoto's invention, when taken in whole with his discussion of the recognized adverse affects of lead containing alloys, is contemplated for lead free alloys. In view of the above, the use of Sn-Bi and Sn-Bi-Ag reflowed alloy layers is clearly shown by Tanimoto and the use of lead free alloys with these Sn-Bi and Sn-Bi-Ag reflowed layers would be understood by one of ordinary skill in the art to be obvious since lead containing solders are disclosed to be shunned.

### ***Response to Arguments***

12. Applicant's arguments filed October 7, 2002 have been fully considered but they are not persuasive with regards to the remaining rejections.

13. Regarding the provisional rejection of claims 1-14, 19-27 and 40-83 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 14-50 of copending Application No. 09/581,631, the claims of both applications are directed to the same invention of using a Sn-Bi alloy layer on electronic articles and the use of lead free solders on these layers. It is noted that the both pending applications contain claims that are specific to the same types of devices (e.g. semiconductor devices - see claims 36-50 of SN 09/581,631 and claims 1-14, 19-27, 40-42, 58-59, 78-82 of SN 09/972,178) and electronic devices having electrodes and circuit boards (e.g. see claims 14-35 of SN 09/581,631 and claims 43-59 of SN

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09/972,178) with the same compositions and layers. There is no patentable distinction between the two sets of pending claims.

10. Regarding the rejection of claims 1-14, 19-27 and 40-83 under 35 U.S.C. 103(a) as being unpatentable over Tanimoto (U.S. Patent 6,110,608), applicant argues that Tanimoto is not relevant since "Tanimoto, et al discloses a lead structure with two layers, used together with an additional layer for welding or soldering (that is, an additional layer such is, ~ the solder layer)". Applicant's characterization of Tanimoto is not correct since Tanimoto specifically discusses that he also considers embodiments for his invention wherein the two-layer structure plated layers are melted with the result that components such as Bi or Ag, contained in a new plated layer formed during re-solidifying after melting are in the state of dilution by Sn (e.g. see column 6, lines 7-19, for two-layer reflow for lower Bi content). In view of the above, it is clear that Tanimoto clearly discloses such a reflow melting of the two layers into a single alloy layer to be part of his invention. Applicant also argues that Tanimoto does not utilize a lead free solder in his invention. The examiner notes, however, that Tanimoto clearly discloses that the use of "Pb contained in the solder has an adverse affect on human bodies. For that reason, in spite of its excellent properties, use of the solder is shunned. Recently, therefore, Sn alloys which do not contain Pb, that is, Sn-Ag alloy, a Sn-Bi alloy, a Sn-In alloy and a Sn-Zn alloy have taken the place of the Pb-containing Sn alloy" (column 1, lines 60-65). It is clear from Tanimoto's statement on lead containing alloys that Tanimoto clearly understands that lead containing alloys should not be used and that they have been replaced by lead free alloys in current practice. Therefore it would be understood by one of ordinary skill in the art at the time the invention was

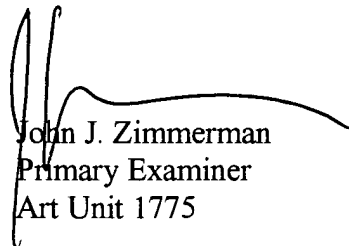


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made that Tanimoto's invention, when taken in whole with his discussion of the recognized adverse affects of lead containing alloys, is contemplated for lead free alloys. In view of the above, the use of Sn-Bi and Sn-Bi-Ag reflowed single layers is clearly shown by Tanimoto and the use of lead free alloys with these Sn-Bi and Sn-Bi-Ag reflowed layers would be understood by one of ordinary skill in the art to be obvious since lead containing solders are disclosed to be shunned.

### *Conclusion*

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Zimmerman whose telephone number is (703) 308-2512. The examiner can normally be reached on 8:30am-5:00pm, M-F. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



John J. Zimmerman  
Primary Examiner  
Art Unit 1775

jjz  
December 30, 2002